UNIT 2 DEFINITIONS (review)

ENGINEERING MATERIALS

1 Scan the following table to find:

1 A metal used to make aircraft
2 Plastics used for adhesives
3 Steel which can be hardened
4 An alloy suitable for castings
5 A plastic with very low friction
6 A material suitable for safety helmets
7 A metal suitable for a salt-water environment
8 A metal for general construction use but which should be protected from corrosion
9 A plastic for car bodies
10 The metal used for the conductors in printed circuit boards

Materials	Properties	Uses
Metals		
Aluminium	Light, soft, ductile, highly conductive, corrosion-resistant.	Aircraft, engine components, foil, cooking utensils
Copper	Very malleable, tough and ductile, highly conductive, corrosion-resistant.	Electric wiring, PCBs, tubing
Brass (65% copper, 35% zinc)	Very corrosion-resistant. Casts well, easily machined. Can be work hardened. Good conductor.	Valves, taps castings, ship fittings, electrical contacts
Mild steel (iron with 0.15% to 0.3% carbon)	High strength, ductile, tough, fairly malleable. Cannot be hardened and tempered. Low cost. Poor corrosion resistance	General purpose
High carbon steel (iron with 0.7% to 1.4% carbon)	Hardest of the carbon steels but less ductile and malleable. Can be hardened and tempered.	Cutting tools such as drills, files, saws
Thermoplastics		
ABS	High impact strength and toughness, scratch-resistant, light and durable.	Safety helmets, car components, telephones, kitchenware
Acrylic	Stiff, hard, very durable, clear, can be polished easily. Can be formed easily.	Aircraft canopies, baths, double glazing
Nylon	Hard, tough, wear-resistant, self-lubricating.	Bearings, gears, casings for power tools
Thermosetting plastics		
Epoxy resin	High strength when reinforced, good chemical and wear resistance.	Adhesives, encapsulation of electronic components
Polyester resin	Stiff, hard, brittle. Good chemical and heat resistance.	Moulding, boat and car bodies
Urea formaldehyde	Stiff, hard, strong, brittle, heat-resistant, and a good electrical insulator.	Electrical fittings, adhesives

2 Use the table above to make definitions of each of the materials in column **A**. Choose the correct information in columns **B** and **C** to describe the materials in column **A**. Try to use different expressions in your definitions.

A	B	C
1 An alloy		allows heat or current to flow easily
2 A thermoplastic		remains rigid at high temperatures
3 Mild steel		does not allow heat or current to flow easily
4 A conductor	a metal	contains iron and 0.7% to 1.4% carbon
5 An insulator	a material	becomes plastic when heated
6 High carbon steel	an alloy	contains iron and 0.15% to 0.3% carbon
7 Brass		formed by mixing other metals or elements
8 A thermosetting plastic		consists of copper and zinc